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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
LEUNG, JENNIFER A	

ART UNIT	PAPER NUMBER
1764	

DATE MAILED: 12/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/824,332	ITO ET AL.	
	Examiner	Art Unit	
	Jennifer A. Leung	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 September 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *26,29-38,54 and 58* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *26,29-38,54 and 58* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment submitted on September 22, 2004 has been received and carefully considered. Claims 1-25, 27, 28, 39-53 and 55-57 are cancelled. Claim 58 is newly added. Claims 26, 29-38, 54 and 58 remain active.

Response to Arguments

2. Applicant's arguments with respect to claims 26, 29-38, 54 and 58 have been considered but are moot in view of the new ground(s) of rejection, as necessitated by amendment.

Claim Objections

3. Claims 37 and 38 are objected to because the claims improperly depend from cancelled claim 25. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 26, 29-38, 54 and 58 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 26, it is unclear as to the structural limitation applicant is attempting to recite by, "... each fluid passage means having at least one fluid entrance and exit to permit the atomization fluid *and the FCC feed* to flow separately into and through," (lines 7-11), and where it is disclosed in applicant's disclosure, as it appears from applicant's specification and drawings

that only atomization fluid, such as steam, flows through said fluid passage means (i.e., a plurality of fluid passage means **34**, each having a fluid entrance **36** and a fluid exit **38**, supply superheated steam only, as shown in FIGS. 1 and 3).

Regarding claim 58, it is unclear what applicants are attempting to claim, as it is unclear as to where the body of the claim begins (i.e., as written, the claim only constitutes a preamble). If applicant is attempting to claim only the at least one feed nozzle as set forth in claim 26, the examiner suggests rewriting the claim as, "A nozzle system comprising the at least one feed nozzle of claim 26."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 26, 30-37, 54 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaufman (EP 0 593 171) in view of Vidusek (US 5,072,883).

Regarding claims 26, 54 and 58, Kaufman discloses a riser reactor **20** (FIG. 1)

comprising at least one feed nozzle (i.e., atomizer **100**; FIG. 1, 2), wherein the feed nozzle comprises,

a central passageway (i.e., annular passage **125**) having at least one feed inlet (i.e., inlet **121**);

an outlet (i.e., of width **c**; see FIG. 2) comprising an atomization zone in fluid communication with the reactor (i.e., atomization zone **150**);

at least one atomization fluid passageway (i.e., annular passage **129**) fluidly communicating with the central passageway **125** via an atomization fluid passageway outlet (i.e., located between conduits **109** and **110**, identified by width **g**; see FIG. 2);

a heating zone configured to promote heat exchange between the feed within passage **125** and the atomization fluid within passage **129** prior to the feed and atomization fluid mixing in the atomization zone **150** (i.e., by the inherent heat transfer through the wall of conduit **109** in the region of direct contact with the atomization fluid in passage **129**, the conduit wall comprising 9 chrom-1-moly steel, for example; see EXAMPLE 1); and

a first mixing zone (i.e., immediately downstream of the openings of width **b** and **d**) comprising a second inlet for an atomization fluid (i.e., atomization fluid fed through inlet **120**) positioned upstream from the atomization fluid passageway outlet **129/g**, wherein the second inlet **120** comprises a sparger (i.e., as defined by conduit **108**) having at least one fluid passageway (i.e., atomization fluid passage **124**) configured to allow fluid passage into the central passageway **125** to promote an axial and/or radial flow relative to the overall direction of the fluid flow in said central passageway **125** (i.e., as evidenced by, "The inner flowing surface [of the liquid feedstock] is impacted by the first axial flow of gas at an impact angle of 5° to 45°," page 3, line 57+; FIG. 2).

In view of the newly added structural limitations, Kaufman is silent as to the heating zone (i.e., the region of thermal contact between passages **129** and **125**) comprising a plurality of fluid passage means, wherein each fluid passage means comprises at least one fluid entrance and exit. In contrast, it appears that the heating zone of nozzle **100** only comprises a single, annular, fluid passage means, with a fluid entrance via inlet **122** and fluid exit via outlet **129/g** (see FIG. 2).

Vidusek (FIG. 1-6; column 2, line 37 to column 3, line 24) teaches a nozzle assembly for atomizing a liquid with external air, wherein the nozzle assembly **10** comprises a central passageway (i.e., axial chamber **25**) for delivery of a pressurized liquid (i.e., supplied by liquid passage **20**) and, in particular, a plurality of fluid passage means arranged peripheral to the central passageway **25** (i.e., defined by a plurality of separate circular bores **45**, each communicating with a fluid entrance **28** and a fluid exit, via cavity **60**). With such configuration, the liquid feed and atomization fluid flow in separate passageways prior to directly contacting downstream at a discharge opening **42**, thereby defining an atomization zone.

It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the heating zone in the nozzle of Kaufman such that its single, annular fluid passage means comprised a plurality of fluid passage means, on the basis of suitability for the intended use and absent showing any unexpected results thereof, because such configuration of the nozzle improves the distribution and uniformity to the liquid droplets in both full cone and hollow cone type spray nozzles, by the use of pressurized jets of air that are channeled to coact with the liquid discharge at a point downstream of the discharge opening. Additionally, the configuration allows for a discharge of substantially uniform thickness and fine droplet size even in the event that the air supply to the nozzle is interrupted, as taught by Vidusek (see column 1,

line 5 to column 2, line 13).

Regarding claim 30, Kaufman discloses the atomization fluid passageway outlet **129/g** comprises a forward acute angle greater than 60° (i.e., "The outer flowing surface [of the liquid feedstock] is impacted by the second angular flow of gas at an impact angle of 15° to 90°," page 3, line 58 to page 4, line 1; FIG. 2).

Regarding claim 31, Kaufman (FIG. 2) discloses the central passageway **125** has a circular cross-section (i.e., as defined by a cylindrical conduit **109**), wherein the atomization fluid passageway outlet **129/g** is positioned concentrically about the central passageway (i.e., as defined by cylindrical conduit **110** being placed concentrically about conduit **109**).

Regarding claims 32 and 37, Kaufman discloses the central passageway **125** (see FIG. 2) has a cross-section having two-dimensions, wherein at least one (i.e., both) of the two dimensions converges in the downstream direction along at least a portion of the length of the central passageway (i.e., the inside diameter of conduit **109** narrows to a diameter having widths **e** and **c** at the downstream end; page 4, lines 45-49).

Regarding claim 33, Kaufman (FIG. 2) discloses the atomization zone **150** comprises a spray distributor defining a fluid passageway (i.e., tip shield **140**; page 4, lines 53-58).

Regarding claims 34 and 35, Kaufman discloses the spray distributor **140** passageway (see FIG. 2) has a cross-section comprising two dimensions, wherein at least one of the dimensions diverges in a downstream direction along at least a portion of the length of the spray distributor fluid passageway (i.e., tip shield **140** having a distance **h** and fastened to conduit **110** at a diverging angle **i**; page 4, lines 53-58).

Regarding claim 36, Kaufman discloses co-planar passageways for the converging

dimension of central passageway **125** and the diverging dimension of spray distributor **140** (see FIG. 2; page 4, lines 53-58).

6. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaufman (EP 0 593 171) in view of Vidusek (US 5,072,883), as applied to claim 26 above, and further in view of Dou et al. (US 5,306,418).

Kaufman is silent as to central passageway **125** comprising a stream splitter positioned within the central passageway **125** and upstream from the position at which the atomization fluid passageway **129** exits into the central passageway, at the location of width **g** (see FIG. 2). Dou et al. teaches a FCC feed nozzle (FIG. 5) for the atomization of a liquid feed stream supplied via inlet **20**, wherein the feed nozzle comprises a central passageway **22** containing a stream splitter (i.e., impingement plug **50**; column 10, line 54 to column 11, line 35). It would have been obvious for one of ordinary skill in the art at the time the invention was made to provide a stream splitter to the central passageway **125** in the apparatus of Kaufman, on the basis of suitability for the intended use and absent showing any unexpected results thereof, because the stream splitter would provide further atomization of the oil/steam mixture, as taught by Dou et al.

7. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaufman (EP 0 593 171) in view of Vidusek (US 5,072,883), as applied to claim 26 above, and further in view of Dean et al. (US 4,331,533).

Kaufman is silent as to riser reactor **20** comprising a plurality of feed nozzles **100** (FIG. 2). In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to provide a plurality of feed nozzles to the riser reactor of Kaufman, on the basis of suitability for the intended use and absent showing any unexpected results, because the

duplication of parts merely involves ordinary skill in the art. *St. Regis Paper Co. v. Beemis Co. Inc.* 193 USPQ 8, 11 (1977); *In re Harza* 124 USPQ 378 (CCPA 1960). Dean et al. (FIG. I, IV; column 16, line 59 to column 17, line 29) evidences this well known concept by teaching a riser reactor **2** comprising a plurality of feed nozzles **4** for introducing feed and steam, to achieve a high temperature catalyst suspension as desired by the processing concepts of the invention.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

* * *

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is (571) 272-1449. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer A. Leung
December 10, 2004

Hien Tran

HIEN TRAN
PRIMARY EXAMINER